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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/780,022	CHAWLA ET AL.	
	Examiner	Art Unit	
	GERALD SMARTH	2478	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 October 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. It is hereby acknowledged that 10/780022 the following papers have been received and placed of record in the file: Remark date 10/12/10.

2. Claims 1-55 are presented for examination. Claims 34-40 are being amended.

3. Rejection of 35 U.S.C. 101 in previous office action is withdrawn based on amended claims.

Response to Remarks

4. Applicant's arguments filed on 10/12/10 have been fully considered but they are not persuasive.

Applicant argues on page 13 and 14, the combination of Sanchez and Chloe fails to teach a single lookup table being accessed based on a first portion of a packet header, where the first portion comprises at least part of a multicast destination address and the lookup table identifies a portion of a second lookup table. Further, as discussed below, the combination of cited references fails to show, teach, or suggest accessing the portion of the second lookup table based on a second portion of the packet header, where both accessing acts of Claim 1 are performed by a network device. Even though Sanchez uses and identifier from both a Unicast Routing Table

and flow-specific identifier from Mulitcast FIT, the identifier retrieved from Unicast Routing Table is looked up using a unicast destination IP address.

Examiner respectfully disagrees, and does view Sanchez in view Chloe as teaching the limitations of these claims. In response, Sanchez discloses in the present embodiment, under certain conditions, (e.g., if the network node itself is a Rendezvous Point router (RP)), when a multicast packet is received on an interface, the network node interprets the source address in the multicast IP packet as the destination address for a unicast IP packet; (see paragraph[26]). Choe's method first comprised of utilizing a multicast IP packet to be forwarded for a unicast IP packet. This is considered using both multicast and unicast as part of the destination address. The claim does not specify that the multicast destination address is utilizing only a multicast packet. Thus it can be understood how this teaches a multicast destination address.

Applicant further argues on page 14, Action, Sanchez fails to disclose this claim feature. See Office Action, p. 4. Choe's prefix of an incoming packet is used to search Choe's skip list, purportedly accessing a hash table associated with the prefix during the search. See Choe [0062], [0068]. Thus, Choe's hash table purported second lookup table) is accessed in accordance with the search, and not based on a second portion of the packet header. Accordingly, Choe's accessing a hash table fails to show, teach, or suggest the claimed act of accessing the portion of the second lookup table based on a second portion of the packet header.

Examiner respectfully disagrees, and considers a prefix as teaching a header in the claim. Basing on the second portion of the packet header can be understood as matching the prefix length (i.e. 30 and 26) for the given node (see paragraph [62]). The prefix has a range, the prefix length explains the different portions of the prefix. The hash tables are considered to teach the

lookup tables. Each hash table is associated with a different prefix length, thus explaining a second lookup table based on a second portion of the packet header (see fig.6).

Applicant argues, since the retrieval of an identifier from Unicast Routing Table fails to teach the claimed act of accessing a first lookup table, the Office Action must be relying on the retrieval of an identifier from Multicast Forwarding Information Table to teach this claimed feature. But the Office Action then cites to Choe's skip list to purportedly teach the claimed first lookup table identifying a portion of a second lookup table. See Office Action, p. 5.

Examiner disagrees, as explained previously Sanchez explains a multicast destination address. Further Choe uses hashing tables which are being considered to be the lookup tables.

Applicant further argues on page 15, the cited sections of Choe disclose using the same prefix to access both Choe's skip list and associated hash tables (the purported first and second lookup tables as asserted by the Office Action). Id. Thus, the cited sections of Choe fail to teach both claimed acts of accessing a first lookup table based on a first portion of a packet header and accessing the portion of the second lookup table based on a second portion of the packet header.

Examiner respectfully disagrees, as addressed in the previous argument the hash table is understood to teach the look up table, thus the argument is moot.

Applicant argues, the cited sections of Sanchez and Choe fail to disclose the claimed acts of accessing being performed by a network device. As recognized by the Office Action, Sanchez fails to disclose this feature. See Office Action, p. 4. Choe's nodes of the skip list are not disclosed to be computer nodes, but are instead nodes of a linked list. See Choe [0055].

Examiner respectfully disagrees, Choe does teach these limitations. Examiner would like to clarify that the nodes not strictly the header are performing the accessing of the hash tables. The nodes can be considered to be forwarding devices such as routers (see paragraph [008]). These are known to be part of networks, further the use of ip addresses also show that these nodes can be used for networks.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1, 2, 6, 7, 16, 19, 20, 24, 25, 34, 35, 37, 39, 40, 41 42, 46, 47, 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanchez (2003/0223402) in view of Choe(2002/0118682),

Regarding claim 1, Sanchez teaches a method, comprising:

accessing a first lookup table based on a first portion of a packet header, wherein the first portion of the packet header comprises at least part of a multicast destination address,**(Sanchez fig. 2) (Sanchez discloses in operation, after receiving a multicast packet, Interface Identifier Retrieval Logic 31 examines the packet's header and retrieves two expected incoming interface identifiers--a source-specific one from the Unicast Routing Table 10 and a flow-specific one from the Multicast FIT 20 according to the header information. Paragraph [32])**

Sanchez does not explicitly disclose the first lookup table identifies a portion of a second lookup table, the portion of the second lookup table comprising at least one entry; and accessing the portion of the second lookup table based on a second portion of the packet header; wherein the accessing the first lookup table and the accessing the portion of the second lookup table are performed by a network device.

However Choe does teach the first lookup table identifies a portion of a second lookup table, the portion of the second lookup table comprising at least one entry; **(Choe discloses In FIG. 6, the node 220 has route entries ranging from 32 to 24 and each prefix length has its own hash table to store route entries matching to the corresponding prefix length; see Paragraph[62] also see paragraph [61])** and

accessing the portion of the second lookup table based on a second portion of the packet header. **(Choe discloses In FIG. 6, the node 220 has route entries ranging from 32 to 24 and each prefix length has its own hash table to store route entries matching to the**

corresponding prefix length; see Paragraph[62] also see paragraph [61]. see fig.6 -224 for second portion of packet header)

wherein the accessing the first lookup table and the accessing the portion of the second lookup table are performed by a network device. **(see Choe Fig.6 header node)**

It would be obvious to one of ordinary skill in the art before the time of the invention to modify Sanchez's efficient reverse path forwarding check mechanism to include Choe's apparatus and method for performing high-speed IP route lookup and manage routing/forwarding tables. One of ordinary skill in the art would have been motivated to make this modification at the time of the invention in order to prevent bottlenecking with routers. See Choe paragraph[12]

Regarding claims 2, 20 & 42, Sanchez in view of Choe taught the method and system of claims 1, 19 & 41, as described above. Sanchez further teaches wherein the second lookup table identifies at least one output interface via which a packet comprising the packet header should be output. **(Sanchez discloses and then retrieves an interface identifier from either the Unicast Routing Table 10 or the Multicast FIT 20 according to the value of the RPF Flag. paragraph [35])**

Regarding claims 6, 24 & 46, Sanchez in view of Choe taught the method and system of claims 2, 21, & 42, as describe above. Sanchez further teaches wherein the packet header comprises a source address, the portion of the second lookup table corresponds to a shortest-path multicast tree if a match for the source address is found in the first lookup table, **(Sanchez discloses**

whether the router has already joined the Shortest Path Tree (SPT) for the (S,G) flow; Paragraph [20]) and the portion of the second lookup table corresponds to a shared multicast tree if no match for the source address is found in the first lookup table. **(Sanchez discloses if there is a match, the multicast packet is received on a correct incoming interface, and the network node will forward the multicast packet. However, if the identifiers do not match, the network node will discard the multicast packet; Paragraph [26])**

Regarding claim 7, 25 & 47 Sanchez in view of Choe taught the method and system of claims 2, 20 & 42, as described above. Sanchez further teaches wherein the accessing the portion of the second lookup table comprises providing a key to the second lookup table, wherein the key comprises an ID of a RPF (Reverse Path Forwarding) interface, and the RPF interface received a packet in which the packet header was comprised. **(Sanchez discloses a RPF Flag stored in association with multicast flow information determines from which table the interface identifier is obtained; Abstract)**

Regarding claim 16, Sanchez in view of Choe taught the method of claim 2, as described above further comprising:

allocating a single entry in the first lookup table for each shortest-path multicast tree. **(Sanchez discloses whether the router has already joined the Shortest Path Tree (SPT) for the (S,G) flow; Paragraph [20])**

Regarding claim 19, Sanchez teaches a system comprising:

a network device, wherein the network device comprises:

a first lookup table comprising a plurality of first lookup table entries; a second lookup table comprising a plurality of second lookup table entries;**(Sanchez discloses in one embodiment, when the network node receives a multicast packet via an incoming interface, the network node performs two table lookups; Paragraph [8])**

and a lookup restriction unit, wherein the first lookup table is configured to identify first information in response to receiving a first key generated from a first portion of a packet header, **(Sanchez discloses first, the network node performs a lookup on a first table (e.g., a multicast Forwarding Information Table) to retrieve an RPF flag and a first incoming interface identifier. Paragraph [8])**

the first portion of the packet header comprising a multicast destination address, **(Sanchez discloses in operation, after receiving a multicast packet, Interface Identifier Retrieval Logic 31 examines the packet's header and retrieves two expected incoming interface identifiers--a source-specific one from the Unicast Routing Table 10 and a flow-specific one from the Multicast FIT 20 according to the header information. Paragraph [32])**

Sanchez does not explicitly disclose the first information identifying a portion of the second lookup table, the portion comprising at least one of the second lookup table entries; and the lookup restriction unit is configured to prevent a second key generated from a second portion of the packet header from matching any second lookup table entry that is not comprised in the portion of the second lookup table identified by the first information.

However Choe does teach the first information identifying a portion of the second lookup table, the portion comprising at least one of the second lookup table entries; **(Choe discloses In**

FIG. 6, the node 220 has route entries ranging from 32 to 24 and each prefix length has its own hash table to store route entries matching to the corresponding prefix length; see Paragraph[62] also see paragraph [61]) and the lookup restriction unit is configured to prevent a second key generated from a second portion of the packet header from matching any second lookup table entry that is not comprised in the portion of the second lookup table identified by the first information. **(Choe discloses referring back to FIG. 6, a variable `MaxLevel` of the header node 210 represents the maximum level number among all the nodes belonging to the skip list, i.e., the total number of pointers at the header node to point to other nodes; Paragraph [61])**

It would be obvious to one of ordinary skill in the art before the time of the invention to modify Sanchez's efficient reverse path forwarding check mechanism to include Choe's apparatus and method for performing high-speed IP route lookup and manage routing/forwarding tables. One of ordinary skill in the art would have been motivated to make this modification at the time of the invention in order to prevent bottlenecking with routers. See Choe paragraph[12]

Regarding claim 34, Sanchez teaches a computer readable storage medium, comprising storing program instructions executable by a processor to:

allocate at least one entry in a first lookup table and at least one first entry in a portion of a second lookup table for each multicast tree, the portion of the second lookup table comprising at least one entry; **(Sanchez discloses used herein, a multicast (S,G) flow, or a (S,G) flow, refers to a sequence or stream of packets being sent from a source "S" to a multicast group "G." S refers to the unicast IP address of the source for the multicast traffic; Paragraph [21])**

Sanchez does not explicitly disclose configure a lookup restriction unit to prevent a lookup in the second lookup table from matching entries not included in the portion of the second lookup table if a corresponding lookup in the first lookup table matches the at least one entry in the first lookup table.

However Choe does teach configure a lookup restriction unit to prevent a lookup in the second lookup table from matching entries not included in the portion of the second lookup table if a corresponding lookup in the first lookup table matches the at least one entry in the first lookup table. **(Choe discloses in FIG. 6, the node 220 has route entries ranging from 32 to 24 and each prefix length has its own hash table to store route entries matching to the corresponding prefix length. If route entries exist corresponding to each prefix length ranging from 32 to 24, inclusive, then the corresponding node will have nine (9) pointers to point to nine (9) different hash tables. Each hash table only stores route entries exactly matching its prefix length; see Paragraph [62] also see paragraph [61])**

It would be obvious to one of ordinary skill in the art before the time of the invention to modify Sanchez's efficient reverse path forwarding check mechanism to include Choe's apparatus and method for performing high-speed IP route lookup and manage routing/forwarding tables. One of ordinary skill in the art would have been motivated to make this modification at the time of the invention in order to prevent bottlenecking with routers. See Choe paragraph[12]

Regarding claim 35, Sanchez in view of Choe taught the computer readable medium of claim 34, as described above. Sanchez further teaches wherein the program instructions are further executable to: allocate a single entry in the first lookup table for each shortest-path multicasttree.

(Sanchez fig. 2)

Regarding claim 37, Sanchez in view of Templin taught the computer readable medium non-transitory storage of claim 36, wherein the program instructions are further executable to: allocate a plurality of entries in the second lookup table for each shared multicast tree, **(Sanchez Fig. 2)** wherein each of the entries corresponds to a respective one of a plurality of scopes, and each of the entries only identifies output interfaces included in a zone of the respective one of the plurality of scopes. **(Templin discloses here, when the bit `u` equals 1, the scope of the address is global and when the bit `u` equals 0, the scope is local; Paragraph [227])**

Regarding claim 39, Sanchez in view of Choe taught the computer readable medium non-transitory storage of claim 34, as described above. Sanchez further teaches wherein the program instructions are further executable to: access a first lookup table based on a first portion of a packet header, wherein the first lookup table identifies the portion of a second lookup table; and access the portion of the second lookup table based on a second portion of the packet header. **(Sanchez discloses in operation, after receiving a multicast packet, Interface Identifier Retrieval Logic 31 examines the packet's header and retrieves two expected incoming interface identifiers--a source-specific one from the Unicast Routing Table 10 and a flow-specific one from the Multicast FIT 20 according to the header information. Paragraph [32])**

Regarding claim 40, Sanchez in view of Choe taught the computer readable medium non-transitory storage of claim 39, wherein the program instructions are further executable to:

provide a key to the second lookup table, wherein

the key is generated based on an ID of a RPF (Reverse Path

Forwarding) interface**, (Sanchez discloses however, if the RPF Flag is not set, at step 48, the RPF engine 50 retrieves a unicast outgoing interface identifier corresponding to the packet's header information from the Unicast Routing Table; Paragraph [39]**) and the RPF interface received a packet in which the packet header was comprised. **(Sanchez discloses in operation, after receiving a multicast packet, Interface Identifier Retrieval Logic 31 examines the packet's header and retrieves two expected incoming interface identifiers--a source-specific one from the Unicast Routing Table 10 and a flow-specific one from the Multicast FIT 20 according to the header information. Paragraph [32]**)

Regarding claim 41, Sanchez teaches a system comprising:

network interface means for receiving a packet header via a network link;

means for accessing a first lookup table based on a first portion of the packet header, wherein the first portion of the packet header comprises a multicast destination

address, **(Sanchez discloses in operation, after receiving a multicast packet, Interface Identifier Retrieval Logic 31 examines the packet's header and retrieves two expected incoming interface identifiers--a source-specific one from the Unicast Routing Table 10 and a flow-specific one from the Multicast FIT 20 according to the header information. Paragraph [32]**) and

the first lookup table identifies a portion of a second lookup table, the portion of the second lookup table comprising at least one entry; **(Choe discloses In FIG. 6, the node 220 has route entries ranging from 32 to 24 and each prefix length has its own hash table to store route entries matching to the corresponding prefix length; see Paragraph[62] also see paragraph [61]) (Sanchez discloses the network node may also perform a lookup on a second table (e.g., a Unicast Routing Table) to retrieve another incoming interface identifier; Paragraph [8])** and means for accessing the portion of the second lookup table based on a second portion of the packet header. **(Choe discloses In FIG. 6, the node 220 has route entries ranging from 32 to 24 and each prefix length has its own hash table to store route entries matching to the corresponding prefix length; see Paragraph[62] also see paragraph [61])**

It would be obvious to one of ordinary skill in the art before the time of the invention to modify Sanchez's efficient reverse path forwarding check mechanism to include Choe's apparatus and method for performing high-speed IP route lookup and manage routing/forwarding tables. One of ordinary skill in the art would have been motivated to make this modification at the time of the invention in order to prevent bottlenecking with routers. See Choe paragraph[12]

Regarding claim 53, Sanchez in view of Choe taught the system of claim 42, as described above. Sanchez further comprising:

means for allocating a single entry in the first lookup table for each shortest-path multicast tree. **(Sanchez discloses whether the router has already joined the Shortest Path Tree (SPT) for the (S,G) flow; Paragraph [20])**

7. Claims 3-5, 17, 18, 21-23, 32, 33, 36, 43-45, 54, 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanchez (2003/0223402) in view of Choe(2002/0118682) in further view of Templin (2001/0040895),

Regarding claims 3, 21 & 43, Sanchez in view of Choe taught the method and system of claim 2, 21 & 42, as described above. Sanchez nor Choe further teaches wherein the portion of the second lookup table corresponds to one of a plurality of scopes.

However Templin does teach these limitations however Templin does teach not explicitly teach wherein the portion of the second lookup table corresponds to one of a plurality of scopes. **(Templin discloses here, when the bit `u` equals 1, the scope of the address is global and when the bit `u` equals 0, the scope is local; Paragraph [227])**

It would be obvious to one of ordinary skill in the art before the time of the invention to modify Sanchez's and Choe to include Templin's IPv6-IPv4 compatibility system. One of ordinary skill in the art would have been motivated to make this modification in order to have a system which will be more efficient, and in less expensive way being able to transition IPv4 systems to IPv6 especially with legacy equipment. Templin discloses these approaches are expensive in terms of configuration and operational administrative resources, and do not adapt to network topology changes. Another approach uses "dynamic tunneling," but requires the use of IPv6 multicast address. Thus, there remains the need for a mechanism that accommodates the transition of networks from IPv4 to IPv6 without the aforementioned problems; Paragraph [5].

Regarding claims 4, 22 & 44, Sanchez in view of Choe in further view of Templin taught the method and system of claims 3, 21 & 43, as describe above. Templin further teaches wherein the portion of the second lookup table corresponds to a link-local scope of the scopes if a scope of the multicast destination address is link-local; **(Templin discloses IPv4 multicast addressing for link state messages; Paragraph [139])**

the portion of the second lookup table corresponds to a site-local scope of the scopes if the scope of the multicast destination address is site-local; **(Templin discloses Here, when the bit `u` equals 1, the scope of the address is global and when the bit `u` equals 0, the scope is local; Paragraph [227])**

And the portion of the second lookup table corresponds to a global scope of the scopes if the scope of the multicast destination address is global. **(Templin discloses Here, when the bit `u` equals 1, the scope of the address is global and when the bit `u` equals 0, the scope is local; Paragraph [227])**

Regarding claim 5, 23 & 45, Sanchez in view of Choe in further view of Templin taught the method and system of claims 4, 22 & 44, as described above. Templin further teaches wherein if a scope of the source address comprised in the packet header is less than the scope of the multicast destination address, each entry comprised in the portion of the second lookup table identifies only output interfaces associated with one of a plurality of zones, **(Templin discloses In particular, the TBRPF protocol allows an update to be sent either on a common broadcast channel or on one or more unicast channels, depending on the number of**

neighbors that need to receive the update; Paragraph [43])and a scope of the one of the zones is equal to the scope of the source address. (**Templin discloses thus, for the examples above, each router 14 in the subnet 10 that detects a change in a link to node A 12, (e.g., node B 14 in the cost of the link (B, A)), operates as the source (i.e., source node) of an update; Paragraph [42])**

Regarding claim 17, Sanchez in view of Choe taught the method of claim 16, as described above. Templin further teaches comprising:

for each shared multicast tree, allocating a first entry and a second entry in the first lookup table, **(Sanchez fig 2)** wherein the first entry matches a source address having a global scope, and the second entry matches a source address having a non-global scope. **(Templin discloses Here, when the bit `u` equals 1, the scope of the address is global and when the bit `u` equals 0, the scope is local; Paragraph [227])**

Regarding claim 18, Sanchez in view of Choe taught in further view of Templin taught the method of claim 17, as described above. Templin further teaches comprising:

allocating a plurality of entries in the second lookup table for each shared multicast tree, wherein each of the entries corresponds to a respective one of a plurality of scopes, and each of the entries only identifies output interfaces included in a zone of the respective one of the plurality of scopes. **(Templin discloses Here, when the bit `u` equals 1, the scope of the address is global and when the bit `u` equals 0, the scope is local; Paragraph [227])**

Regarding claims 32 & 54, Sanchez in view of Choe taught in further view of Templin taught the system of claims 31 53, as described above. Wherein

the first lookup table comprises a first entry and a second entry for each shared

multicast tree, **(Sanchez paragraph [12])** the first entry matches a source address having a global scope, and the second entry matches a source address having a non-global scope.

(Templin discloses Here, when the bit `u` equals 1, the scope of the address is global and when the bit `u` equals 0, the scope is local; Paragraph [227])

Regarding claim 33 & 55, Sanchez in view of Choe taught in further view of Templin taught the system of claims 32 & 54, as described above. Sanchez in view of Templin further teaches wherein the second lookup table comprises a plurality of entries for each shared multicast tree,

(Sanchez paragraph [12])

each of the entries corresponds to a respective one of a plurality of scopes, and each of the entries only identifies output interfaces included in a zone of the

respective one of the plurality of scopes. **(Templin discloses here, when the bit `u` equals 1, the scope of the address is global and when the bit `u` equals 0, the scope is local; Paragraph [227])**

Regarding claim 36, Sanchez in view of Choe taught the computer readable medium of claim 34, as described above. Wherein the program instructions are further executable to: allocate a first entry and a second entry in the first lookup table for each shared multicast tree,**(Sanchez**

Fig. 2) wherein the first entry matches a source address having a global scope, and the second entry matches a source address having a non-global scope. (**Templin discloses here, when the bit `u` equals 1, the scope of the address is global and when the bit `u` equals 0, the scope is local; Paragraph [227]**)

10. Claims 8-12, 14, 15, 26, 27, 30, 31, 38, 48, 49, 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanchez (2003/0223402) in view of Choe(2002/0118682) in further view of Arunachalam (7466703),

Regarding claim 8, Sanchez in view of Choe taught the method of claim 2, as described above. Sanchez nor Choe explicitly discloses the first lookup table indicating at least one of an access control rule and a quality of service level in response to receiving a key associated with a packet However Arunachalam further teaches the first lookup table indicating at least one of an access control rule and a quality of service level in response to receiving a key associated with a packet. **(Arunachalam discloses for each filter specification, there is an associated QoS assignment, which identifies how the packets matched this filter are scheduled by the SRI. Column 19 lines 56-59)**

It would be obvious to one of ordinary skill in the art before the time of the invention to modify Sanchez and Choe include Arunachalam's scalable high speed router apparatus. One of ordinary skill in the art would have been motivated to make this modification at the time of the invention in order to have a system with routers with the capability to process different protocols and services along with other useful features. In addition, routers that are required to

support differentiated services must be able to process more than the destination address of the packet, including for example the source address, the protocol type, the protocol port numbers if available, the Type-of-Service bits etc. Such routers must be also capable of processing all packets as they arrive without requiring any storing of packets before processing for every type of packet arrivals, irrespective of the size of the packets or the information in the packet headers: column 1 lines 26-35.

Regarding claim 9, Sanchez modified in view of Arunachalm taught the method of claim 8, as described above. Sanchez further teaches comprising:

the second lookup table indicating a state of a network flow in response to receiving a key associated with a packet. **(Sanchez discloses wherein the RPF flag value is representative of a state of a multicast flow that includes the multicast packet; Claim 8)**

Regarding claim 10, Sanchez modified in view of Arunachalm taught the method of claim 8, as described above. Arunachalam further teaches comprising:

accessing a third lookup table to forward a packet addressed to an IPv6 (Internet Protocol version 6) unicast destination address, **(Arunachalam discloses RSVP is designed to operate with both unicast and multicast routing-protocols; Column 1926-29)**

Wherein a width of each entry in the third lookup table is less than a width of a key comprising both an IPv6 destination address and an IPv6 source address. **(Arunachalam discloses the route manager supports all standard routing protocols for IPv4, IPv6, and IPX. The following IP routing protocols are supported: Column 18 lines 1-3)**

Regarding claim 11, Sanchez in view of Choe taught the method of claim 2, as describe above. Aunachalam further teaches wherein the first lookup table identifies the portion of the second lookup table by identifying a mask, wherein a key generated using the mask only matches entries comprised in the portion of the second lookup table. **(Aunachalam discloses the above IP source and destination addresses can also be combined with subnet masks to identify a range of IP addresses; Column 19 lines 51-55)**

Regarding claim 12, Sanchez in view of Choe and in further view of Arunachalam taught the method of claim 11, as describe above. Arunachalam further teaches comprising:
applying the mask to the multicast destination address and an interface ID, wherein the interface ID identifies an input interface that received a packet comprising the packet header.
(Aunachalam discloses the above IP source and destination addresses can also be combined with subnet masks to identify a range of IP addresses; Column 19 lines 51-55)

Regarding claim 14, Sanchez in view of Choe and in further view of Arunachalam taught the method of claim 12, as described above. Sanchez further teaches wherein the mask selects all of the source address if the accessing the first lookup table comprised matching an entry, which corresponds to a shortest-path multicast tree, in the first lookup table. **(Sanchez discloses whether the router has already joined the Shortest Path Tree (SPT) for the (S,G) flow; Paragraph [20])**

Regarding claim 15, Sanchez in view of Choe and in further view of Arunachalam taught the method of claim 11, as described above. Sanchez in view of Arunachalam further teaches comprising applying the mask to the second portion of the packet header to produce a masked second portion; and generating a hash based on the masked second portion, wherein the accessing the second lookup table**(Sanchez fig 2)** dependent on the second portion providing a key comprising the hash to the second lookup table. **(Arunachalam discloses the search is done with the use of a hash table 410 as shown in FIG. 17(a); Column 15 lines 26-27)**

Regarding claims 26 & 48, Sanchez in view of Choe taught the system of claims 20 & 48, as described above. Aunachalam further teaches wherein the first information comprises a mask, wherein a key generated using the mask only matches second lookup table entries comprised in the portion of the second lookup table. **(Arunachalam discloses the above IP source and destination addresses can also be combined with subnet masks to identify a range of IP addresses; Column 19 lines 51-55)**

Regarding claims 27 & 49, Sanchez in view of Choe and in further view of Arunachalam taught the system of claim 26 & 48, as described above. Sanchez further teaches wherein the mask is applied to a source address, the multicast destination address, and an interface ID to generate the second key, **(Sanchez discloses In one embodiment, when the RPF flag is set, the flow-specific identifier retrieved from the Multicast FIT 20 is selected. When the RPF flag is not set, the source-specific retrieved from the Unicast Routing Table**

10 is selected; Paragraph [33])

the source address is comprised in the packet header, and

the interface ID identifies an input interface that received a packet comprising

the packet header. **(Sanchez discloses the Interface Selection Logic 32, depending on the value of the retrieved RPF flag, selects one of the two expected incoming interface identifiers for use in RPF checks. Paragraph [33])**

Regarding claims 30, Sanchez in view of Choe and in further view of Arunachalam taught the system of claim 26, as described above. Arunachalam further teaches wherein the mask is applied to the second portion of the packet header to produce a

masked second portion, a hash is generated based on the masked second portion, and

the second key comprises the hash. **(Arunachalam discloses the search is done with the use of a hash table 410 as shown in FIG. 17(a); Column 15 lines 26-27)**

Regarding claim 31, Sanchez in view of Choe taught the system of claim 20, as described above. Sanchez further teaches wherein the first lookup table comprises one first lookup table entry for each shortest-path multicast tree. **(Sanchez paragraph [12])**

Regarding claim 38, Sanchez in view of Choe taught the computer readable medium of claim 34, as described above. Sanchez in view of Aunachalam teaches wherein the program instructions are further executable to: configure the lookup restriction unit by storing a mask in a mask table, **(Sanchez discloses first, the network node performs a lookup on a first table (e.g., a**

multicast Forwarding Information Table) to retrieve an RPF flag and a first incoming interface identifier. Paragraph [8])wherein a key generated using the mask will only match entries comprised in the portion of the second lookup table. **(Aunachalam discloses the above IP source and destination addresses can also be combined with subnet masks to identify a range of IP addresses; Column 19 lines 51-55)**

Regarding claim 52, Sanchez in view of Choe taught the system of claim 42, as described above. Sanchez in view of Arunachalam further teaches comprising
means for applying the mask to the second portion of the packet header to
produce a masked second portion; **(Aunachalam discloses the above IP source and destination addresses can also be combined with subnet masks to identify a range of IP addresses; Column 19 lines 51-55)** and means for generating a hash based on the masked second portion, wherein accessing the second lookup table dependent on the second portion of the packet header comprises: providing a key comprising the hash to the second lookup table. **(Arunachalam discloses the search is done with the use of a hash table 410 as shown in FIG. 17(a); Column 15 lines 26-27)**

8. Claims 13, 28, 29, 50 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanchez (2003/0223402) in view of Choe(2002/0118682) in view of Arunachalam (7466703) in further view of Templin (2001/0040895),

Regarding claim 13, Sanchez in view of Choe in further view of Arunachalam taught the method of claim 12, as described above. Templin further teaches wherein the packet header comprises a source address; the mask selects a portion of the source address identifying a scope of the source address if the source address has a non-global scope; **(Templin discloses Here, when the bit `u` equals 1, the scope of the address is global and when the bit `u` equals 0, the scope is local; Paragraph [227])**

the mask does not select any of the source address if the source address has a global scope. **(Templin discloses Here, when the bit `u` equals 1, the scope of the address is global and when the bit `u` equals 0, the scope is local; Paragraph [227])**

It would be obvious to one of ordinary skill in the art before the time of the invention to modify Sanchez, Choe and Arunachalam to include Templin's IPv6-IPv4 compatibility system. One of ordinary skill in the art would have been motivated to make this modification at the time of the invention in order to have a system which will be more efficient, and in less expensive way being able to transition IPv4 systems to IPv6 especially with legacy equipment. Templin discloses these approaches are expensive in terms of configuration and operational administrative resources, and do not adapt to network topology changes. Another approach uses "dynamic tunneling," but requires the use of IPv6 multicast address. Thus, there remains the need for a mechanism that accommodates the transition of networks from IPv4 to IPv6 without the aforementioned problems; Paragraph [5].

Regarding claims 28 & 50, Sanchez in view of Choe in further view of Arunachalam taught the system of claims 27 & 49, as described above. Templin further teaches wherein

the mask selects a portion of the source address identifying a scope of the

source address if the source address has a non-global scope; **(Templin discloses Here, when the bit `u` equals 1, the scope of the address is global and when the bit `u` equals 0, the scope is local; Paragraph [227])**

the mask does not select any of the source address if the source address has a

global scope. **(Templin discloses Here, when the bit `u` equals 1, the scope of the address is global and when the bit `u` equals 0, the scope is local; Paragraph [227])**

Regarding claim 29 & 51, Sanchez in view of Choe in view of Arunachalam in further view of Templin taught the system of claims 28 & 50, as described above. Templin further teaches wherein the mask selects all of the source address if the accessing the first lookup table comprised matching an entry, which corresponds to a shortest-path multicast tree, in the first lookup table. **(Templin discloses the link-state-routing protocol, referred to as a topology broadcast based on reverse-path forwarding (TBRPF) protocol, seeks to substantially minimize the amount of update and control traffic required to maintain shortest (or nearly shortest) paths to all destinations in the subnet 10; Paragraph [41]),**

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gerald Smarth whose telephone number is (571)270-1923. The examiner can normally be reached on Monday-Friday(7:30am-5:00pm)est.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeff Pwu can be reached on (571)272-6798. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/G. S./

Examiner, Art Unit 2478

/Kenny S Lin/

Primary Examiner, Art Unit 2478